

**CLAIMS**

1. A process for producing a lightened turbomachine blade, which comprises the following operations:
  - 5       a) production of a blank of an airfoil;
  - b) cutting of a cavity into one side, called the hollowed side;
  - c) cutting of a socket in the hollowed side, this socket bordering the cavity and having a bearing surface and a lateral surface;
  - 10      d) production of a cover having an external surface with the shape of the hollowed side and an internal surface opposite the external surface, the socket and the cover being dimensioned so that the cover can be inserted into the socket and bear via its internal surface against the bearing surface so that the external surface lies in the extension of the hollowed side, the lateral surface of the socket surrounding the cover and positioning the latter above the cavity in order to cover this cavity in the hollowed side;
  - 15      e) insertion of the cover into the socket and welding of the edges of the cover to the rest of the airfoil on the hollowed side, the welding being carried out by the rotation of a tool, having a finger and a shoulder, penetrating from the hollowed side between the cover and the rest of the airfoil until contact of the shoulder with the hollowed side and the cover, the tool then being moved along the welding path, and the weld bead penetrates into the airfoil to a depth  $P$  at least equal to the thickness  $EC$  of the edge of the cover so as to provide continuity of material between the edge of the cover and the rest of the airfoil over a depth at least equal to the thickness  $EC$  of the edges of the cover; and
  - 30      f) finishing of the blade.

2. The process as claimed in claim 1, wherein the welding is carried out by a friction welding machine,

this machine comprising a table and a spindle that are capable of relative displacements along three degrees of translational freedom and two degrees of rotational freedom, the spindle causing a welding tool to rotate  
5 about a geometrical axis of rotation, the welding tool having a finger projecting from a shoulder, the blank being placed in a cradle attached to the table, this cradle having a bearing surface of shape complementary to the facing side of the blank, the blank bearing via  
10 its side facing said bearing surface, this cradle also having stops surrounding the blank in order to position the latter laterally in the cradle, the cover being inserted into the socket, the whole assembly formed by the blank and the cover being held in place by a number  
15 of remotely controlled clamps, the rotating finger being pushed into the hollowed side between the edges of the cover and the rest of the airfoil, the shoulder then being flush with the hollowed side, each controlled clamp being retracted upon passage of the  
20 welding tool so as not to interfere with the latter.

3. The process as claimed in either of claims 1 and 2, wherein the blank has, at the tip, at least one extension located in a region beyond that which the  
25 final blade (10) will occupy, the start and the end of the weld bead being in the extension.

4. The process as claimed in any one of claims 1 to 3, with the tip being open, the cavity having a central rib welded to the cover by a central weld bead, the start of which is referenced, wherein the start of the central weld bead is on the lateral weld bead and wherein the central weld bead is produced prior to the lateral weld bead.  
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5. A lightened turbomachine blade obtained by the process as claimed in one of claims 1 to 4.